## Space Weather Forecast

Issued on Sunday, 30 January 2022 at 00:30 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Slight chance G1/Minor Geomagnetic Storm day 1 (30th). Chance of further Moderate flares/R1-R2 Radio Blackouts.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Solar activity has been Moderate through the last 24 hours, also with frequent Common-class flare activity. Most of the flares originated from the large sunspot group in the northeast quadrant, approaching centre disc, and also an active region just beyond the southeast limb. The largest flare observed was a low level Moderate-class flare, from the large sunspot group, just prior to this issue.

There are currently three other numbered sunspot regions on the visible disc, these much smaller, simpler, and less active. These are located in the southwest, northwest and northeast quadrants. No Earth-directed CMEs have been observed.

**Solar Wind / Geomagnetic Activity:** The solar wind has risen slowly from slightly elevated to elevated levels. The magnetic field has been relatively weak, with a slow overall downward trend. The important north-south direction variable and also weak. Geomagnetic Activity was Unsettled to Active (Kp 3-4) between 29/0000-1500UTC, becoming Quiet (Kp 1) thereafter.

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Low solar activity is expected through the period, with a chance of further isolated Moderate-class flares, and a slight chance of Large flares. These again most likely from AR2936, and an active region approaching the southeast limb.

**Solar Wind / Geomagnetic Activity:** A CME could just give a weak Earth-directed glance on day 1 (30 Jan), although confidence is low. Otherwise, elevated solar winds at first on day 1 (30th) are likely to gradually trend lower to slightly elevated levels for much of the rest of the period, as the current high speed stream influence wanes. A further slight enhancement is possible from later on day 3 (01 Feb) from another coronal hole. Geomagnetic activity is expected to be Quiet to Unsettled (Kp 1-3) with a chance of isolated Active intervals (Kp 4) and a slight chance of G1/Minor Storm (Kp 5) intervals on day 1 (30th Jan). Thereafter, becoming generally Quiet to Unsettled, perhaps with a chance of isolated Active intervals from later day 3 (01 Feb).

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) is forecast to most likely remain at background levels, however probabilities increase slightly through the period as the large sunspot group transits west.

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Met Office

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 15 | 5 | 10 | 10 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | Yes | 40 | 40 | 40 | 40 |
| Very Active | R3 to R5 X | No | 10 | 10 | 10 | 10 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 1 | 2 | 5 | 5 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |
| * S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$) | | | | | | |

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